CAPTURING OPPORTUNITIES FOR INNOVATION IN KNOWLEDGE INTENSIVE SERVICES: PRELIMINARY FINDINGS

JUDY MATTHEWS
QUT Business School
QUT
Brisbane
Australia
jh.matthews@qut.edu.au
TEL: INT 61 7 31381734
Fax: INT 61 7 31381313

ROXANNE ZOLIN
QUT Business School
QUT
Brisbane
Australia
r.zolin@qut.edu.au

SUKANLAYA SAWANG
QUT Business School
QUT
Brisbane
Australia
s.sawang@qut.edu.au

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Please address all contact to first author.
DR JUDY MATTHEWS

jh.matthews@qut.edu.au
TEL: INT 61 7 31381734
Fax: INT 61 7 31381313

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ABSTRACT

Research on opportunity has been extensively studied in contexts of new firm or new venture creation (Choi & Shepherd, 2004; Mullins & Forlani, 2005; Ozgen & Baron, 2007) where start-ups and new ventures use both opportunity discovery and opportunity creation (Alvarez & Barney 2005, 2007). Less research is found on examining the relationship between opportunity and innovation in existing firms (with Drucker (1985) an exception). In large firms, opportunity recognition has been analysed in terms of antecedent conditions, elements and outcomes (Ireland, Covin & Kuratko, 2009), but to date less attention has been given to how small and medium enterprises capture and use opportunities to remain competitive. Little research has been carried out regarding how smaller firms use opportunities to create new business with existing customers or use technological advances with new customers to create new economic activity, growth and competitive advantage. This study presents findings from a comparative case analysis of 20 diverse firms in the spatial information industry and identifies constructs associated with identifying opportunities that lead to better business performance and firm level innovation.

INTRODUCTION

Opportunity has been extensively studied in contexts of new firm or new venture creation (Choi & Shepherd, 2004; Mullins & Forlani, 2005; Ozgen & Baron, 2007) and opportunity recognition has long been accepted as an essential capability of entrepreneurs and entrepreneurial firms (Ardichvili, Cardozo, & Ray, 2003; Gaglio & Katz, 2001; Shane & Venkataraman, 2000). Opportunity identification and evaluating and pursuing opportunities

(McMullen & Shepherd 2006), and is vital for all firms to shape their strategy and renewal (Brown, Davidsson, & Wiklund 2001; Zott & Amit, 2007).

Firms that engage in innovative activities compete more successfully in the global marketplace, and achieve company growth (Dodgson, Gann & Salter, 2008). Increased competition, connectivity and technological developments are changing the forms of innovation, as firms are more open to ideas from outside their firms from customers, as well as suppliers (Chesbrough, 2003).

Opportunistic recognition plays an essential role in innovative change (Ardichvili, Cardozo, & Ray, 2003). Previous research indicates that opportunity recognition is understood as an important necessary step to evaluate and pursue opportunities (McMullen & Shepherd 2006), and recognizing opportunities is essential for all firms to shape their strategy and renewal (Brown, Davidsson, & Wiklund 2001; Zott & Amit, 2007). A wealth of research proposes determinants of this opportunity recognition and its outcomes (i.e. innovative changes or strategic renewal), however, this research is unable to provide an in-depth understanding of how firms respond to this recognition and lead to innovative actions. This paper aims to answer the main research question: how do small and medium sized firms in the spatial information industry recognize opportunities and generate new economic activity and innovation for their business advantage?

A comparative case analysis of 20 diverse firms in the spatial information industry identifies constructs associated with identifying opportunities that lead to better business performance and firm level innovation. Using a case study approach with interviews with CEO's, founding partners and senior managers and site visits with follow-up phone calls where

necessary we identified two distinct patterns of opportunity identification and development used for innovation in these companies. The first approach to identifying opportunities for developing new value added services for existing customers, is largely used by small firms and appears to emerge from longstanding close relationships with customers who were seeking novel solutions to new problems. A second different approach to opportunities largely used by medium sized spatial services firms, was more focused on the application of recent and existing competencies often developed with new technologies, and the exploitation these competencies within existing and new markets. We discuss these findings in relation to the importance of prior knowledge (Shane & Venkataraman, 2000, Shepherd & DeTienne, 2005) and human and social capital (Davidsson & Honig, 2003) and elaborate on these findings in framing our conclusions.

Thus, our study has several important contributions to theory and implications for practice. First, we study how opportunities are perceived in firms in the spatial information sector. Second, we examine how firms respond to such opportunities resulting in innovative activities. Third, we show that firms ascribe their innovative activities as a response to opportunities and the outcomes of such responses.

We are seeking to make three contributions to the literature. First, we suggest that the distinct patterns of opportunity identification found in existing firms extend the notions of opportunity commonly used for new firm creation or new ventures. Second senior managers of existing firms explicitly link responding to opportunities and creating new opportunities to engaging in a range of innovative activities to pursue their firm's survival and growth. The third contribution is recognition that firms perceive an association or responding to

opportunities and developing solutions or new products or services or practices as necessary for their firm's economic survival and prosperity.

Opportunity identification and entrepreneurial actions

Numerous studies recognize that to survive and prosper, organizations need to continually identify new opportunities beyond their existing competencies (Hamel & Prahalad, 1989; McGrath, Tsai, Venkataraman, & MacMillan, 1996). Identifying opportunities has been recognized as one of the most important abilities of successful entrepreneurs (Ardichvili, Cardozo, & Ray, 2003) and consequently has become a central element of the study of entrepreneurship (Alvarez & Busenitz, 2001; Gaglio &d Katz (2001).

Factors that influence opportunity identification include prior knowledge and knowledge of the industry. Shane and Venkataraman (2000) contend that both prior knowledge and the cognitive ability to value are necessary to identify an opportunity as well as the cognitive properties necessary. Prior knowledge of customer problems leads to the identification of more opportunities and opportunities that are more innovative (Shepherd & DeTienne, 2005). Choi & Shepherd (2004) found that entrepreneurs are more likely to exploit opportunities when they perceive more knowledge of customer demand for the products.

Shane (2000) argues for discovery rather than search and opportunity discovery is a problem-solving process where an organized search leads to answers about unsolved problems (Hsieh, Nickerson & Zenger (2007). Zahra (2008) contends that certain technology contexts may be more conducive to discovering opportunities whereas others encourage both creation and discovery and Shepherd, McMullen & Jennings (2007)'s theoretical framework

suggests that opportunities evolve from third-person opportunity beliefs to a first person opportunity belief, and the importance of self-efficacy in opportunity recognition.

A recent article with comprehensive reviews of both conceptual and empirical articles on opportunities confirmed that opportunity continues to be a central concept in the entrepreneurship field (Short, Ketchen, Shook & Ireland, 2010). This article summarizes and discusses four themes in opportunity literature: the nature of opportunities, antecedents to opportunities, outcomes of opportunities and moderators of opportunities and we revisit this literature in discussion of findings. This paper builds on the extensive previous research on opportunity and furthermore links findings to research on innovation activities and improved business outcomes.

Innovation in Knowledge intensive services

Knowledge intensive sector strongly focus on the human and social capital of the firm (Grant, 1996). Organisational theorists contend that, for a mature organisation to develop the capacity for sustained innovation, it must successfully make these 'innovation-to-organization connections in three key areas: 1) *make resources* available for new products; 2) *provide collaborative structures and processes to solve problems creatively* and *connect innovations with existing businesses* and 3) *incorporate innovation* as a *meaningful component* of the organization's strategy' (Dougherty & Hardy 1996, 1122).

Many of the existing studies of firm level innovation are based on large firm studies and a recent article suggests that a "systematic analysis of the innovation–performance relationship in SMEs to our best knowledge is nonexistent" (Rosenbusch, Brinkmann & Bausch, 2011: 442). This study reports findings from a two-year comprehensive study of innovation

activities in companies in the spatial information industry. This paper investigates how firms in knowledge intensive service firms identify and respond to opportunities for new economic activity and innovation.

RESEARCH DESIGN AND METHOD

The objective of this research is to identify relationships between opportunity recognition and innovation in knowledge based firms in the spatial information industry. Our inquiry used a multiple case study methodology research design (Eisenhardt and Graebner, 2007; Yin, 2005). We examined firms in their natural setting, visiting the firms and interviewing senior managers and CEOs face to face discussing their current businesses, and the engagement of their firm in innovative activities. Multiple cases provide the possibility of cross-case comparison with the potential for more interesting findings (Yin, 2005).

The Spatial Information is a rapidly growing industry that consists of companies offering a wide range of geographic-related services such as surveying, remote sensing, location based services, photogrammetry, mapping, aerial imagery, land development, environmental management, geographic information systems, web services and Global Positioning Systems (GPS) amongst others.[1] The SI industry contributes up to $12.5 billion annually to Australia's gross domestic product.[2] This industry includes diverse with firms with a history of surveying and others spatial service firms more focused on application of information technology. Some small firms are family businesses while medium sized firms are partners in international collaborations.

An interdisciplinary research team was used for data collection, in accordance with the

[1] http://www.spatialbusiness.org/aus/Position-On-Issues
[2] http://www.spatialbusiness.org/

methodology described. A team of three researchers and one graduate student with strengths in innovation, entrepreneurship, strategy, marketing, history, technology management and organizational behavior worked on this project. This disciplinary breadth enabled a multi-perspective, interactive examination of the phenomenon of interest. The diverse perspectives of the multidisciplinary research team shaped the development of the interview protocols for the semi-structured interviews, the data collection and data analysis, generating rich discussions and insights. The interview protocols were also discussed with industry experts to ensure appropriate terminology and language were used in the data collection phase.

Sample selection

A guided non-representative sample was created from the a list of organizations in the spatial industry business association (SIBA) members list, including surveying and other spatial firms with different sizes on both the east and west coast of Australia. Sampling included four firms Queensland, four in New South Wales, five in Western Australia, six firms in Victoria and one in the Australian Capital Territory. We began with a list of companies obtained from SIBA and their characteristics, and contacted companies to request their participation in face-to face semi-structured interviews with one member of the research team. We updated existing information from information provided and ascertained through company information on the web and phone conversations who would be the appropriate personnel with direct involvement with innovation.

Data collection

An interview protocol developed from in-depth discussion of the different dimensions of the research questions was trialed during the first few interviews and the modification developed were used throughout the project. Semi-structured face to face interviews that on average

lasted approximately 1 to 1.5 hours were employed to explore the activities and orientation of 20 firms structured interviews. The interview protocol was much broader than the information presented in this paper, given the comprehensive nature of the overall research program. We developed question areas investigating aspects of business strategy, innovative activities, organizational interfaces, processes, skills, metrics, culture, and leadership. We used semi-structured interview to have comparability across firms and used these interviews to obtain better ideas about issues of importance to them.

Their use of the notion of opportunity and the diverse nature of this phenomenon across firms was the inspiration for this paper. All interviews were recorded and transcribed and interviewers also took field notes. Both transcribed interviews and the field notes were used in the data analysis. In addition to the face to face interview and company observations with each company during the site visits, follow-up phone calls or emails were used to seek clarification or greater depth in particular areas.

The key informant in each company was the person or persons with primary responsibility for developing and implementing the business strategy. The identities of the companies are concealed in the discussion of specific managerial practices in accordance with confidentiality agreements between the organizations and the researchers. Using thematic analysis, the recorded transcribed interview data were analyzed for patterns and variations.

DATA ANALYSIS AND FINDINGS

First we examined the nature of the firms and found distinct patterns in their business. We deduced that firms active in this industry use spatial information in a number of ways and their activities can be broadly clustered into three groups: Category A: Predominantly

Surveying firms; Category B: Predominantly Spatial Sciences firms and Category C a combination of Surveying and Spatial Sciences firms. The primary activities of Category A firms are measuring, assembling and assessing land and geographic related information to be used for land planning and implementing the efficient administration of the land and the structures thereon, e.g. engineering and mining surveyors or boundary surveyors.[3] Firms in Category B consist of spatial information users and information technology firms that manage and analyse data that has geographic, temporal, and/or spatial context. This category also includes development and management of related information technology tools, such as aerial and satellite remote sensing imagery, GPS, and computerised geographic information systems (GIS).[4] In addition we found another category - Category C firms that may have begun as surveying firms and moved into more spatial information users, or have started as IT firms that have their own surveying section to carry our survey work.

Each of these categories of firms contains a large spectrum of diverse firms. In addition, a certain overlap between Category A and Category B firms can be observed: as some Category A firms move onto spatial territory and several Category B sciences firms have their own surveying subdivision. For the purpose of this research, however, the interviewed firms are divided into the three separate groups mentioned with Category C representing only two firms that were clearly active in both categories. The proportion of firms in each category is shown in Table 1.

Insert Table 1 here

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[3] http://www.sssi.org.au/details/cat/8/sub/9.html

[4] http://www.crcsi.com.au/About/What-is-Spatial-Information

Our second findings were that firms appeared to generate innovative activities based on their perceptions of opportunity. These forms of opportunity were identified as originating from two different sources: from customers and from recently acquired capabilities. We discuss these as follows.

I. Opportunities originating from requests from customers

Most innovations the firms developed were client-driven and most of the firms respond to client requests for new solutions. When asked where the ideas for their current innovative activities came from, 13 of the 20 respondents referred to specific client requests as a source of innovation:

Firms respond to client-driven and client-funded requests as opportunities to develop new ways of working and then apply their innovative solutions in future projects with future clients. More than 65% of firms responses to external requests from customers were sources of new ideas. One interviewee commented that one way to increase the level of innovation in his firm was: *'A client and two of our key people'*.[5]

> *New ideas are always solution based to the problem that we are faced with. We don't sit here thinking up scenarios, we are given scenarios and that is how our innovation comes up. The trigger is always a problem that comes from an external source.*[6]

Opportunities identified by firms include making decisions about whether and when to respond to opportunities to tender and/or when to respond more directly and build on existing relationships with firms. For example some smaller firms argued that "rather than engage in a 'race to the bottom' based on competitive pricing", they maintained a reputation for

[5] B51
[6] A3

selective quality work in the industry and were then approached directly by organisations faced with new problems with no known solutions.

In comparison, one large firm engaged in providing spatial information services to mining companies, discussed using the knowledge they had captured in current and past projects and locating an office in towns with proximity to mine sites, to increase the likelihood of being able to present their unique value-added perspective in the tender process.

What might look like an opportunity often needed some early exploration before firms committed to a full engagement. For example one firm discussed situations where they carried out some exploratory work in what looked like opportunities in middle eastern countries, but subsequently found that work taken up by competitors and had not lead to the expected success.

Opportunities were also often linked to new technologies

> *We are presented with opportunities on a very regular basis, new opportunities to apply our current technology into other applications … we are always being asked to trial our technology in another application.*

Many firms reported that new technologies and large amount of data capture in a short space of time had increased the accuracy of their work and the breadth of response. Opportunities identified by non-survey spatial information firms are often around developing or applying current technology to new applications or integrating current systems and services.

If we can't make money out of it then we are probably not going to do it. We are not an R&D organization…So we could see an opportunity coming for a particular customer which might need the integration of several technologies, so let's spend the next two weeks let's build a little prototype … that can be good practice ot have a competitive advantage over someone else..

Relationships with customers and how we handle problems with work are very relevant to the firm's reputation.

Taking the perspective that 'a problem is the opportunity to excel' so we can do then do things with a client, but it is not until things go wrong that they see how we handle issues and then you know they appreciate it". We had an example last week ….

My personal view is that if you don't validate it (opportunity) with the end customer then you are wasting your time…At the end of the day opportunities for us come back to projects and you need to start actually talking to companies about individual projects.

The founders of this business saw an opportunity in the marketplace for services that weren't just purely survey or purely development because we studied both strands through university, and they saw an opportunity to grow a business that captures both types of services in … adding value for clients in the deliverables we offer.

A government mandated significant change to the electricity industry led to significant IT expenditure than demanded new and different approaches. For example, the contestable gas market in many states created new opportunities.

> *Government mandated change drove opportunities for us. Our company built the central systems that manage the gas market in NSW, ACT, WA and SA.*

2. Opportunities arising from current capabilities for innovative activities

Firms reported innovations that had actually taken place in their firms during the past year. Much of the innovation carried by these firms was incremental, often shaped by the need to ensure the financial viability of the firm such as increased speed, accuracy and efficiency of work. In addition, the opportunity to develop solutions for new and existing challenges often led to new ways of working, employing new technologies or applying existing technologies in new ways. Firms often did not describe their new activities as innovative. These changes are understood as being part of continuous improvement in a competitive industry, often to deliver a quality product, service or solution for returning clients. Early adoption of new technologies, often after testing and experimentation and sometimes even beta testing of new technologies were reported.

The firms engaged in a wide range of innovative activities. Product innovations included, for example, a natural language search engine, the sales of new technology and the use of sophisticated graphs for image pattern recognition. Examples for marketing innovations include the use of social media and the introduction of several new marketing concepts. Process innovations included new manufacturing techniques and new processes to draw up

plans, and organisational innovations included going public and the introduction of new management team work strategies.

Relatively few of the interviewed Category A firms mentioned organisational or managerial innovations, while almost all Category B firms mentioned one or more product or service innovations. Firm size does not seem to have an effect on the type of reported innovations. Figures 1 and 2 provide an overview of the mentioned innovations per firm type.

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Insert Figure 1 here

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Insert Figure 2 here

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When the participants were approached to take part in a formal interview, many firms did not perceive themselves as innovative. During the interviews, however, we noted that most firms are engaged in continuous improvement, and many interviewees were able to mention one or more innovations in their firm during the past year. Out of the 20 interviewed companies, 14 mentioned one or more product or service innovations during the last year. Six firms mentioned one or more marketing innovations, eight firms mentioned one or more process innovation and seven firms mentioned organisational innovations. Figure 3 provides an overview of the reported innovations.

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Insert Figure 3 here

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Innovation's contributions to the firm

In reflecting about how the firm was carrying out its business now, compared to the recent past, many managers stated that many of the significant changes and improvements arose from recent initiatives. 16 of the 17 firms identified that innovation plays an important role in their company. Nine interviewees, 45% of firms (Nine interviewees) stated that innovation is (very) important for their company. One founding CEO, for instance, says:

> *It has been the absolute critical foundation of this company's success and continued success, has been and will be—innovation.*[7]

Those interviewees, who elaborate on the importance of innovation in their firms, provide different reasons for this. Firstly, more than one company states that innovation is crucial to their existence. The manager of a small Category B company, for instance, says that without their investments in innovations, they 'would not exist'.[8]

Secondly, innovation is described as a way to stay ahead of their competitors or to differentiate themselves from them. A large Category C company manager, for instance, says:

> *Being a service oriented company in a competitive environment, we need to continually look for innovation to improve the product and the service delivery. The clients won't stay with the same product, if someone else comes out and says 'Oh you know, my widget has got a whistle for the same price', then they will go with that, even if they don't want a whistle, they will just say, 'Oh well, I'm getting more why wouldn't I want one with a whistle'.*

[7] B12
[8] B5

Innovation is also important for small as well as large companies. One small Category A firm, for instance, commented,

> *Things have been done completely differently now, and if we hadn't changed and kept pace with that, we wouldn't be here.*[9]

Thirdly, innovativeness is also important to manage company growth. A small Category C GIS Coordinator formulates this as following:

> *[O]ur business is in a growing stage, so managing a growing business requires innovative ideas. Going by your definition we are introducing …. systems and processes, so that you are able to manage that growth and also compete. So it is not just about competing in the marketplace, but also about how you are growing the business.*[10]

Not surprisingly, most firms mentioned one or more innovations that were new to the firm. More surprising was the number of reported innovations that were new to the world. The new to the world innovations were all reported by the Category B firms, both small and medium/large firms. There was also a strong relationship between firm age and these type of innovations: all new to the world innovations were reported by firms founded after 1997, while firms in our sample founded before 1997, reported no new to the world innovations.

Business Outcomes and Benefits from Innovation

Apart from the innovation outcomes previously mentioned, most interviewees allude to several other benefits their firm has gained from innovation. A large majority of interviewees

[9] A2
[10] C1

refer to innovation as a key factor to increase their reputation. A particular outcome commented on included having a reputation for innovative practice and showing some flexibility and agility with client briefs. 70% of firms noted improvements to their reputation.

A client executive from a large Category B firm says:

> *No doubt reputation improves; people like to see innovative companies. Customers don't always like to pay, but they like to think they are dealing with something new, sexy and good.*[11]

The CEO of a large Category B company even goes as far as to say that:

> *[Innovation] has built our reputation; it is wholly responsible for our reputation.*[12]

Subsequently it is not surprising that a majority of interviewees report an increase in their sales and income due to their innovation activities. The CEO of a medium to large Category B company expresses this concisely:

> *What are the benefits? Survival and growth.*[13]

Another big Category B company even states they have become market leader due to their innovation.[14] An additional benefit from innovation that many firms mention is the improvement of the firm's internal processes, such as time efficiency. Many of the interviewees further report that their innovations have helped them to attract new customers or to gain recurring customers. A large Category C firm reports that customers stay with the firm because of

[11] B7
[12] B12
[13] B12
[14] B10

'our innovative approach to doing it and our solutions are technically superior to the others. We were told that'.[15]

This applies not only to national customers: eight of the 20 interviewees report that their innovations have contributed to their firm's internationalisation. The reported benefits of innovation are presented in Figure 3.

Human Factors in Opportunity Identification and Innovation

Human capital and knowledge are essential factors in knowledge-intensive services, in terms of the knowledge resources of the firms and their agility in responding to opportunities and at the customer interface. Firms were proud of their good industry knowledge, keeping up to date with (technical) publications, having a highly qualified staff, and describing the importance of 'good governance or a good board'.

All senior managers were university educated and qualified in their disciplines with extensive prior knowledge and experience in industry. Many firms promoted from within with professional training and external education available for their staff. In other cases specialist staff are hired for particular expertise. Three firms for instance specifically mentioned hiring staff with a specific expertise that was needed.

Having an organizational culture that was open to new ways of working and supportive of some experimentation was also seen as important. 65% of firms remarked that the corporate culture and internal processes of their firms were conducive to new ways of working.

We offer staff the opportunity to innovate within their own work environments.

[15] C1

- *We use Friday afternoons at times when staff work on the big picture stuff; so nothing that is client specific, we are saying right what can we work on for the next half a day that is going to get us closer to our big picture.*

Firms also described good human resource management practices such as a personal reward for achievements or kudos from peers.

One small Category A firm is proud of their reputation for as 'of being innovative'.[16] Several others refer to staff-related benefits resulting from their innovations, such as enhanced staff motivation and high staff retention. A managing director from a small Category A firm says:

> *I think it is a way of engaging the staff, by having the best sort of stuff is a way of engaging them and keeping them.*[17]

A medium size Category A Firm reports that his staff benefitted from their innovations in a very direct way:

> *… it (innovation)makes the job easier for your staff which means they are not getting as fatigued, or it is safer for them, certainly ... [We were] able to reduce the risk of injury to our staff, so things like there is an obvious advantage to you know, protect your staff.*[18]

Outcomes identified by firms from their innovation orientation

Firms in the spatial information industry described highly competitive markets and the need to respond to market pressure. Participants identified several external and internal factors that are sources of ideas for their current innovations and also factors that encourage innovation in their firms. Figure 4 summarises these responses. Most interview participants, especially

[16] A1
[17] A2
[18] A5

Category A and small firms, reported high to very high competition explaining that this high competition makes it important for firms to stay at the cutting edge of technology and to find the best and most efficient solutions to problems. One example:

> *External forces such as price of jobs and things like that … the bigger picture is to be competitive in the industry, and cost effectiveness.*[19]

Most firms stated that they were early to adopt new innovations and three firms related the market pressure directly to innovation. One small company describes innovation as the reason for their survival[20] and a large Category B company says:

> *I would say that we tend to do it more out of necessity or you know you have to be unique to innovate in order to keep up, so I guess that is there.*[21]

Limitations

Sampling across types and sizes of firms and locations were broad to enable investigation of diverse firms and. While sampling processes were informed by the SIBA database as well as advice and assistance to select a balanced sample, it is likely that a different selection process may have generated different results.

DISCUSSION AND CONCLUSIONS

The spatial information (SI) industry is an industry facing increased demands for new solutions to existing problems as well as a frontier with new possibilities and opportunities largely generated by new technological developments. This industry is characterized by high tech firms, such as those developing GPS technology, as well as other firms that use more

[19] C1
[20] B2
[21] B8

mature SI technology, such as surveyors. We targeted this industry because its growth and mature markets in the same industry make this a good population to study opportunity recognition. Little research has been carried out on the processes used in these firms to identify opportunities or the characteristics of these firms and their environments.

Firms in the spatial information industry compete in a fast changing market where increasingly sophisticated technology creates the potential for new ways of working, new ways of solving problems and faster, more accurate and more efficient solutions. In such markets and industries, knowledge and ability to generate and capture new knowledge is essential for business survival and success.

Comparing the internal and external sources of opportunities identified in this study, the importance of prior knowledge and industry experience are common to all firms. Similarly a reputation for quality work was mentioned as a trigger in repeat requests by previous customers in attracting new challenges for problem solving and also for purchasers of new technical solutions.

The first approach to identifying opportunities for developing new value added services for existing customers is largely used by small firms, and appears to emerge from longstanding close relationships with customers who were seeking novel solutions to new problems. A second different approach to opportunities largely used by medium sized spatial services firms, was more focused on the application of recent and existing competencies often developed with new technologies, and the exploitation these competencies within existing and new markets.

Insert Table 2 here

Recent research on the approach of small and medium sized firms to their environment and situation suggest that "fostering an innovation orientation has more positive effects on firm performance than creating innovation process outcomes such as patents or innovative products or services "(Rosenbusch, Brinckmann & Bausch, 2011: 441).

Findings from this study confirm and extend previous research on opportunity recognition regarding the importance of prior knowledge (Ardichvili et al, 2003; Shane & Venakataraman, 2000), the importance of human and social capital (Davidsson & Honig, 2003), and provide examples where opportunities are discovered and others are created (Alvarez & Barney, 2007; Short et al, 2010). In addition the importance of timing, previously noted (Dimov, 2007) in terms of responsiveness to problems as the potential from recombining existing solutions for first mover or early mover advantage in exploiting new competencies.

Findings also confirm Choi & Shepherd's (2004) findings that firms are more likely to exploit opportunities when they perceive more knowledge of customer demand for the product and more fully developed technologies. The firms in this study ascribed much of their success as related to their closeness to customers and knowledge of customer's concerns and demands. This study provides some indication that firm level entrepreneurial attitudes

and behaviours are strongly linked to the innovative activities initiated by firms to maintain or improve their business performance.

This study makes the following contributions to the literature. First, we suggest that the distinct patterns of opportunity identification found in existing firms extend notions of opportunity identification commonly used for new firm creation or new ventures. Second senior managers of existing firms make an explicit link between responding to opportunities and creating new opportunities and engaging in a range of innovative activities to pursue their firm's survival and growth. The third contribution is the recognition that firms perceive an association or responding to opportunities and developing solutions or new products or services or practices as necessary for their firm's economic survival and prosperity. Managers are clear that these paths are real outcomes of responding to opportunities to generating new economic activity and innovative practices.

Future research may further investigate the potential links between opportunities and innovative activities in less knowledge intensive industries.

Table 1. Information Firms

Firm code	Interviewee's function	Firm category	Firm size	Firm location
A1	Director	Category A	Small	NSW
A2	Managing Director	Category A	Small	NSW
A3	Director	Category A	Medium	NSW
A4	Registered cadastral Surveyor, Owner	Category A	Small	QLD
A5	Office Manager	Category A	Medium	QLD
A6	General Manager; Operational Manager	Category A	Small	WA
B1	Chief Executive Officer	Category B	Medium	ACT
B2	Managing Director, Owner	Category B	Small	NSW
B3	Survey Manager	Category B	Large	QLD
B4	Managing Director	Category B	Small	QLD
B5	Manager	Category B	Small	VIC
B6	Managing Director, Geo spatial systems developer	Category B	Small	VIC
B7	Client executive	Category B	Large	VIC
B8	Managing Director	Category B	Medium	VIC
B9	Managing Director, Chief Executive Officer	Category B	Medium	VIC
B10	R&D Manager	Category B	Medium	WA
B11	Managing Director	Category B	Medium	WA
B12	Chief Executive Officer	Category B	Medium	WA
C1	GIS Coordinator	Category C	Small	VIC
C2	Business Development Manager	Category C	Medium	WA

TABLE 2. Comparison of Perceived Sources of Opportunity

Construct	Internal Source	External Source
Prior knowledge	H - perceived as expert in field	H – perceived as expert in field
Industry Experience	H > 15 years	H > 20 years
Perceived openness to experimentation and problem solving	M	H – responds to challenge of now problem
Reputation for quality work	H – High performing players in industry	H –Repeat requests from satisfied customers
Application of new technologies	H – early adopter	M
Category of Spatial Information Firm	Category B – spatial services	Category A – survey firms
Leverages new competencies	H	L
Small agile firms	M	H -
Medium size firms	H	M

FIGURE 1. Innovation Type by Firm Size

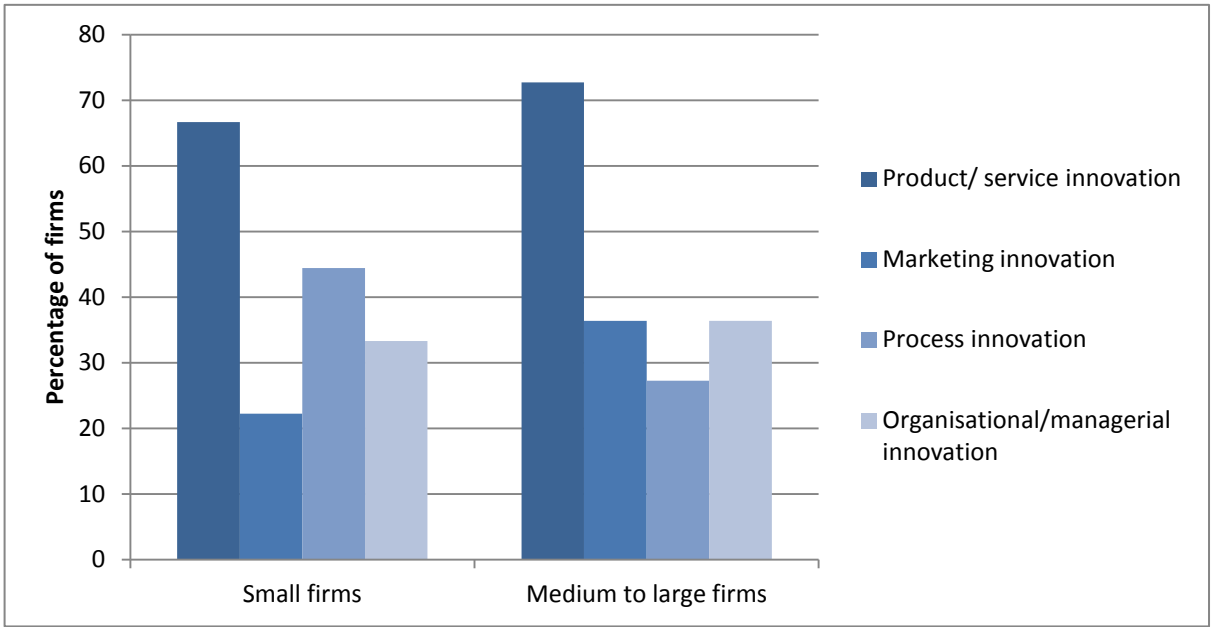


FIGURE 2. Innovation Types by Firm Category

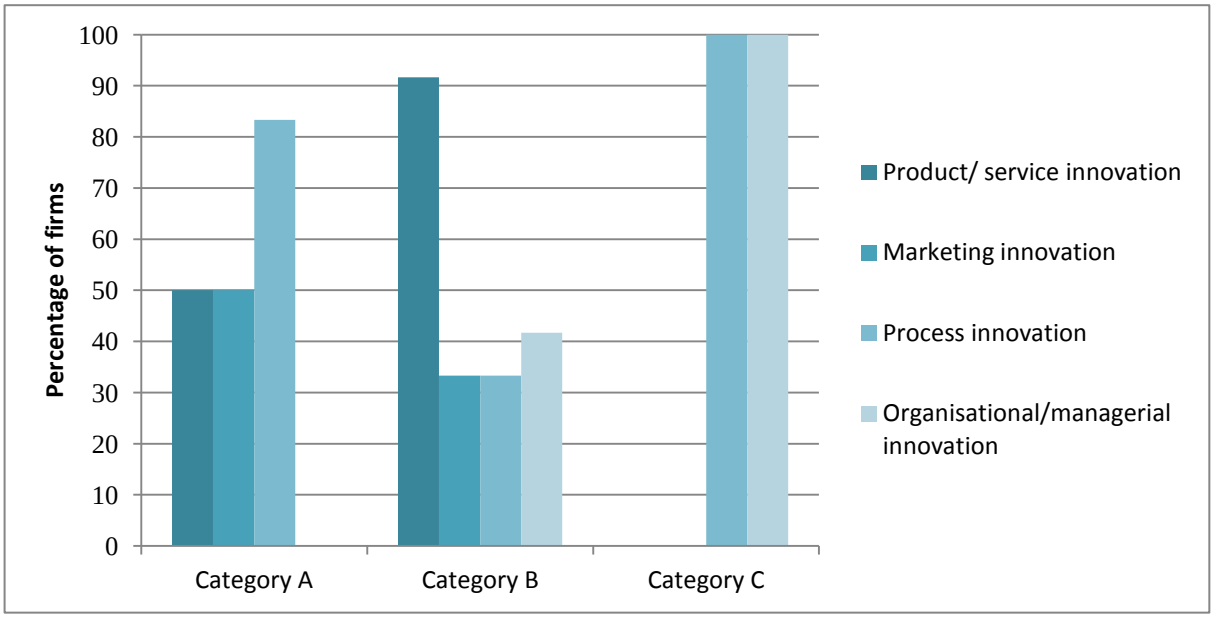


FIGURE 3. Reported Benefits of Innovation to Firms.

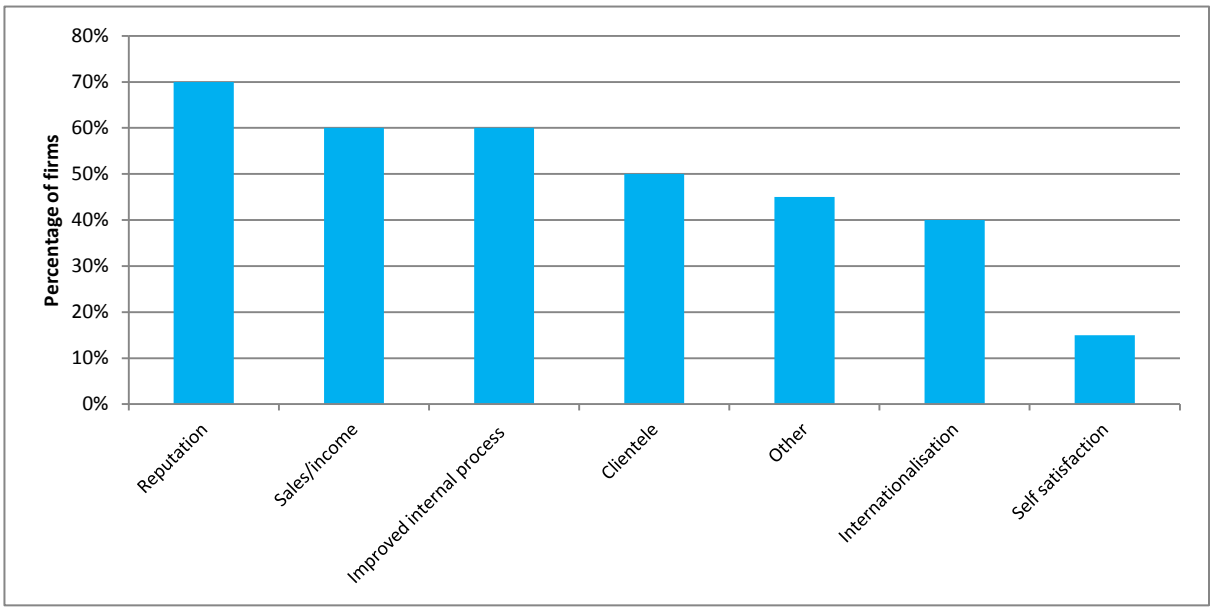


FIGURE 4. Enabling Factors For Innovation

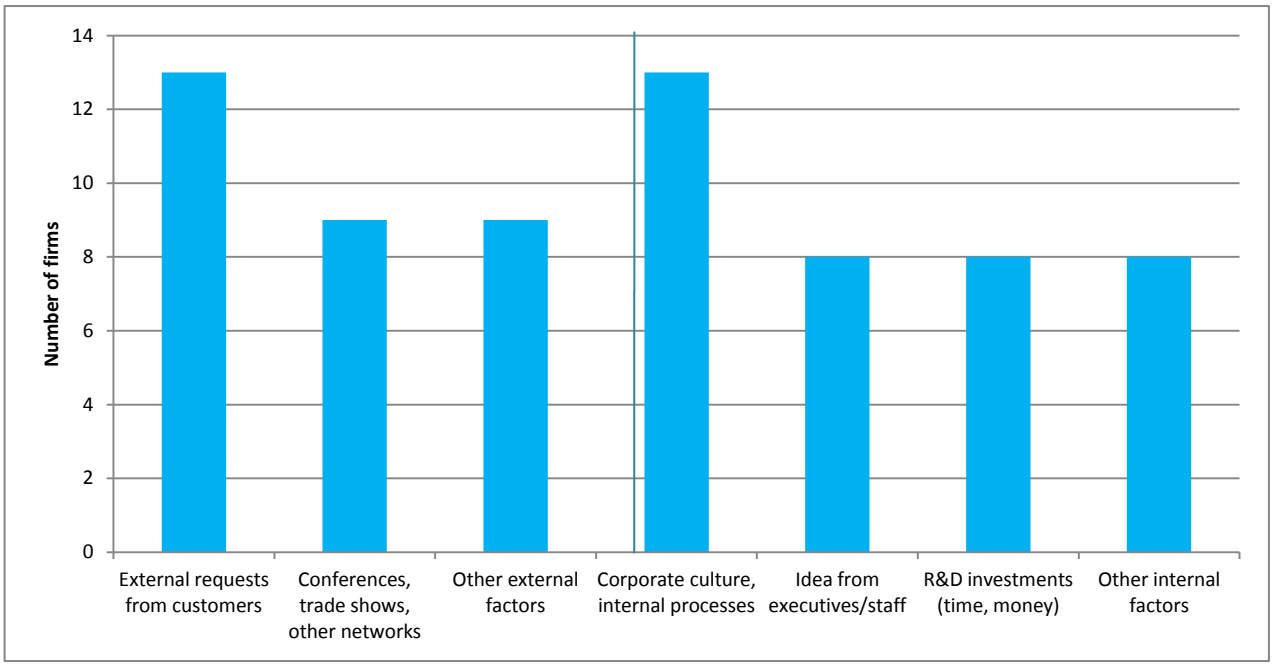
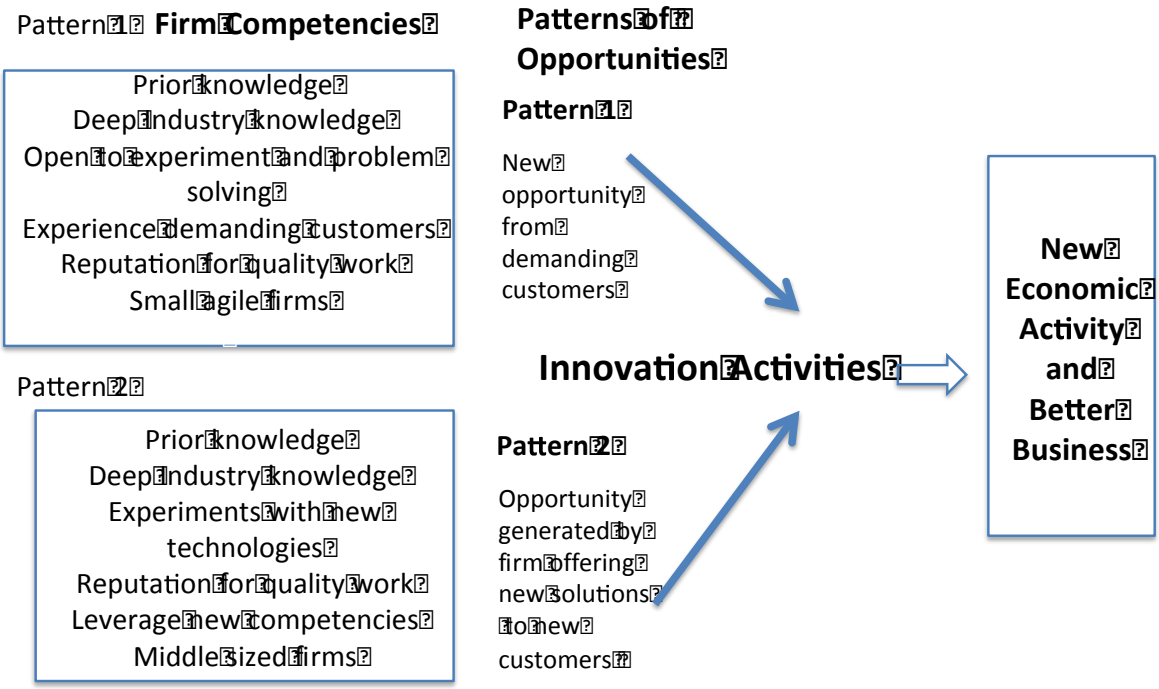


FIGURE 5.

Opportunity and Innovation in Spatial Information Firms



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